ASOS MODIFICATION NOTE 66 (for Electronics Technicians)
Engineering Division
W/OSO321: WDW

SUBJECT	:	Installation of a Uninterruptible Power Supply (UPS) in a Large Class I Data Collection Package (DCP) Cabinet (62828-40070-60)
PURPOSE	:	To provide a backup AC power source
EQUIPMENT AFFECTED	:	The UPS will be tied electrically between the incoming facility AC power and the Power Distribution Assembly (PDA) to the DCP.
PARTS REQUIRED	:	Field Modification Kit (FMK): S100-FMK127 (See appendix B)
MOD PROCUREMENT	:	Washington Central Support will issue one UPS to each Class I DCP that does not have a UPS installed.
TOOLS REQUIRED	:	#1 Flat blade screwdriver #1 Phillips screwdriver #2 Phillips screwdriver 1" Adjustable wrench 5/8" Socket wrench Crimping tool (58078-3) with die (58080-1) Pliers Maintenance Note 46
RECOMMENDED TOOLS	:	AMP pin extractor tool (P/N 843473-1) AMP pin insertion tool (P/N 91002-1)
TIME REQUIRED	:	5 Hours
AFFECT ON OTHER INSTRUCTIONS	:	None
EFFECTIVITY	:	Sites listed in appendix A
CERTIFICATION STATEMENT	:	This modification is authorized by the following ECPs: **98SM05F225** and **S00893**.

GENERAL

This modification contains procedures to install the Deltec PowerRite Pro II UPS (Model # 05144188 A) and UPS bypass circuitry into a 42-inch wide DCP cabinet (P/N 62828-40070-60). The UPS provides backup AC power to the DCP in the event of intermittent or total facility power loss. Backup power is provided to the UPS by a 48-volt DC battery pack which the UPS monitors and maintains an optimal charge under normal operating conditions.

Completion of this modification changes the DCP cabinet part number to 62828-40070-70.

This modification note consists of five parts:

A. Before Installation of the UPS.
B. Installation of the UPS in a Class I DCP.
C. System Checkout.
D. After UPS Installation.
E. Reporting Modification.

PROCEDURE

The following instructions outline procedures for installation of the UPS.

NOTE: Ensure the solid-state time delay relay (SSTDR) (K1) has been installed inside the DCP prior to performing this modification. If the relay has not been installed, Modification Note 52 must be performed.

A. Before Installation of the UPS

1. Call the Automated Surface Observing System (ASOS) Operations and Monitoring Center (AOMC), by calling 1-800-242-8194, and provide notification on which ASOS the UPS will be installed.

2. Get approval of the responsible meteorologist-in-charge (MIC)/official-in-charge (OIC)/observer before starting installation. Installation of the UPS may be performed on any day of the month if restrictions in steps 3 and 4 are satisfied.

3. **Commissioned Sites Only:** Do not start installation during inclement weather, precipitation, instrument flight rule conditions, or if any of those conditions are expected within 3 hours. The responsible MIC/OIC/observer will define these meteorological conditions.

4. Do not start UPS installation at a time that will conflict with scheduled synoptic observations at Ø0, Ø3, Ø6, Ø9, 12, 15, 18, and 21Z. Allow 4 hours to complete installation and restart ASOS.

5. Immediately before beginning work at the National Weather Service (NWS)-staffed sites, the MIC/OIC/observer will inform the air traffic control tower (ATCT) and other critical users that ASOS will be turned off for the DCP upgrade. At an unstaffed site, electronics technicians will inform the ATCT using controller video displays and operator interface devices (OID) that sensor data will be missing during this modification.

6. Do not begin the installation process until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.

7. At the OID, log on as TECH.

   a. Key **MAINT** - **ACT** - **FMK** and enter **MOD 66**.

   b. Key **MAINT** - **ACT** - **FMK** - **START**.

B. Installation of the UPS in a Class I DCP

WARNING

Ensure the AC power is completely removed from the DCP. DEATH OR SEVERE INJURY may result if power is not completely removed from the DCP prior to starting work on this modification.

CAUTION

Power reset kit (62828-40430-10) must be installed in the DCP before the UPS bypass kit (62828-40431) can be installed. Firmware revision 2.50 or higher must be present in the ACU memory card for ASOS to monitor this change.

1. Open the DCP cabinet and switch OFF the primary module circuit breaker, 2A1A3A1.

2. At the AC junction box, open the junction box and switch OFF the circuit breaker labeled DCP.

3. Unfasten the screw at the top of circuit breaker rack, 2A1A3, and lower the assembly. Continue by detaching the safety lanyard from the right side on the circuit breaker rack and *gently* rest the rack on the edge of the DCP cabinet.

4. On the PDA, 2A1A4, remove the white jumper wire from 2A1A4-9B and 2A1A4-17C.

5. Locate the wire which runs from 2A1A9K1-4 to 2A1A4-12A. Disconnect the wire end from the PDA and relabel with wire marker A1A9XK3-2.

NOTE: To make the wire of the UPS bypass circuit easier, dismounting the SSTDR and din rail (2A1A9) from the DCP backplate (2A1) is recommended.

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6. Install the K3 relay onto the XK3 socket. Attach the wire retainer to the XK3 socket and over the K3 relay. Refer to figure 1.

7. Slide the digital input/output (I/O) module K2 and high-power relay XK3 onto the din rail next to the SSTDR K1. Install the end clamps on each side of the UPS bypass assembly. Refer to figure 2.
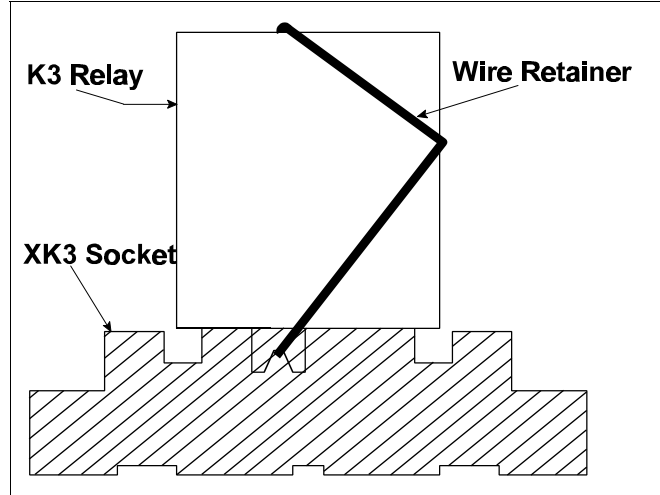

Figure 1   High Power Relay - Side View

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH DOD-STD-100.
2. WORKMANSHIP SHALL BE IN ACCORDANCE WITH MIL-STD-454, REQUIREMENT 9.
3. INSTALL FN7 PER INFORMATION CONTAINED ON THE MARKERS.
4. FOR INSTALLATIONS USING DELTEC UPS: REMOVE TERMINATION AND MARKER AT A1A6BLK. APPLY MARKER, FN 8 AND CONNECT TO P45-1.
5. REMOVE MARKER AT A1A4-12A, P/O 62828-42103-10, W132. APPLY MARKER, FN9, AND TERMINATION, FN12. CONNECT TO A1A9XK3-2.
   REMOVE MARKER AT A1A4-9C, P/O 62828-42103-10, W132. APPLY MARKER, FN10, AND TERMINATION, FN12. CONNECT TO A1A9XK3-3.
6. INSTALL STRAP, FN11, AS NECESSARY TO SECURE HARNESS, FN7, TO EXISTING HARNESS.
7. MARKER MATERIAL: INSULATION SLEEVING, WHITE, HEAT SHRINKABLE SPEC MIL-I-23053/5. SELECT APPROPRIATE SIZE SLEEVING FOR WIRE.
   ALTERNATE MATERIAL: .0025 THICK WHITE POLYESTER FILM ON ACRYLIC BASED ADHESIVE BACKING, PART NO. LAT-11-747W-5. VENDOR: W.H. BRADY CO. CAGEC: 85480
   MARK .08 MIN HIGH (PRE-RECOVERED) BLACK GOTHIC STYLE CHARACTERS. TRIM TO WITHIN .03 MIN OF EXTREME EDGE OF CHARACTERS. SPACE BETWEEN LINES TO BE .03 MIN.
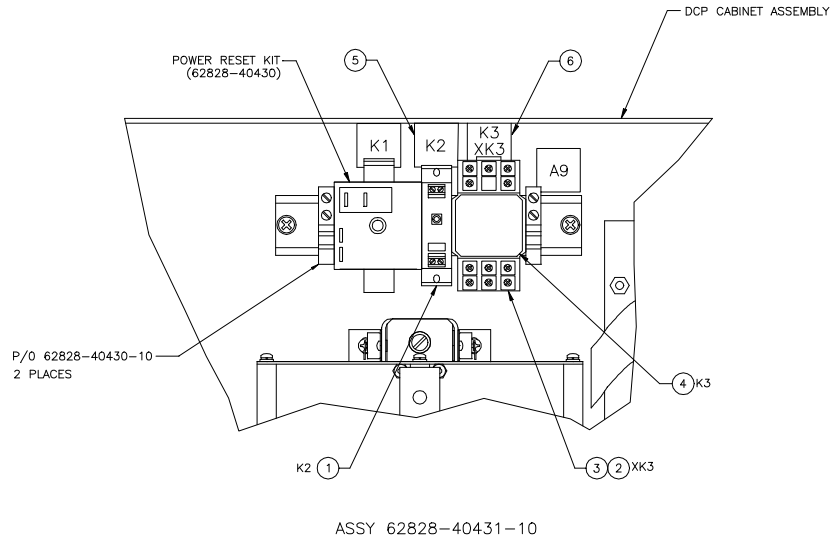
DASH NO.	MARKER INFORMATION
1	P45-1
2	A1A9XK3-2
3	A1A9XK3-3

Figure 2   UPS Bypass Assembly Components and Installation

8. Perform wire connections listed in the following table:

FROM WIRE BUNDLE	WIRE LABEL	CONNECT TO
W131	A1A9K2-1/A1A9XK3-5	K2-1
	A1A9K2-2/A1A9XK3-A	K2-2
	A1A9XK3-5/P33-1 A1A9XK3-5/A1A9XK2-1	XK3-5
	A1A9XK3-6/P33-2 A1A9XK3-6/A1A9XK3-B	XK3-6
	A1A9XK3-1/A2XA12P2-B2	XK3-1
	A1A9XK3-2/A1A9K1-4[1] A1A9XK3-2/A1A6-BLK	XK3-2
	A1A9XK3-3/A1A4-9C	XK3-3
	A1A9XK3-9/A1A4-17C	XK3-9
	A1A9XK3-8/A1A4-12A	XK3-8
	A1A9XK3-7/A2XA12P2-A23	XK3-7
	A1A9XK3-B/A1A9XK3-6	XK3-B
	A1A9XK3-A/A1A9K2-2	XK3-A
	A1A9K2-3/A2XA12P2-B1	K2-3
	A1A9K2-4/A2XA12P2-C8	K2-4

9. Reinstall the UPS bypass assembly din rail to the DCP backplate, and install the UPS bypass labels above each module as shown in figure 2.

10. Route the UPS bypass wire harness, W131, along the existing harness in the cabinet running from 2A1A9 to the PDA. In the W131 wire harness, route the four thin, white wires to the back of the VME rack (2A1A2). Spot tie the new harness to the existing harness with cable ties to keep it in place. More wiring will be added later; do not tighten the cable ties yet.

11. On the PDA, locate and remove the white jumper wire from 2A1A4-9B to 2A1A4-17C.

12. Locate the following wires tied back in wire bundle W15 near 2A1A4, and access the two 18-AWG white wires coming from P44.

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[1] Wire from bundle W132 of mod note 52, relabeled and rerouted for this mod note.

13. From the FMK, cut the green wire in half. Using these wires and the white wire, apply wire markers as illustrated in figure 3.
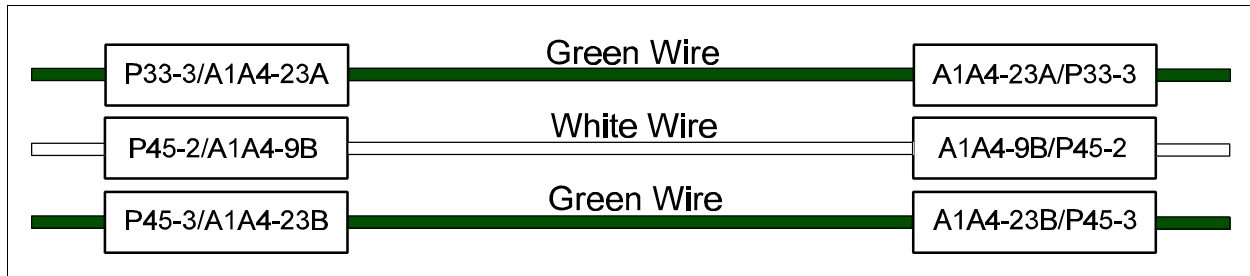

Green Wire	
P33-3/A1A4-23A	A1A4-23A/P33-3
White Wire	
P45-2/A1A4-9B	A1A4-9B/P45-2
Green Wire	
P45-3/A1A4-23B	A1A4-23B/P45-3

Figure 3   UPS Power Wires

NOTE: When making connections to the PDA, ensure the wires are not inserted too far into their terminals. If this occurs and the terminal screw is tightened down, the wire insulation may prevent proper contact from taking place.

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14. Connect the following wires to the PDA. Check each connection made by giving a slight tug on the wire.

FROM WIRE BUNDLE	WIRE LABEL	CONNECT TO
W131	**A1A4-12A/A1A9XK3-8**	**A4-12A**
	A1A4-17C/A1A9XK3-9	**A4-17C**
	A1A4-9C/A1A9K3-3	**A4-9C**[2]
W15	**A1A4-26B/P44-1**	**A4-26B**
	A1A4-27A/P44-2	**A4-27A**
Step 8	**A1A4-23A/P33-3**	**A4-23A**
	A1A4-9B/P45-2	**A4-9B**
	A1A4-23B/P45-3	**A4-23B**

15. In wire bundle W131, remove the marker and termination from the wire labeled A1A6-BLK and relabel as P45-1/A1A9XK3-2. Remove contact terminations from the wires labeled P33-2/A1A9XK3-6 and P33-1/A1A9XK3-5. Connect these wires and the wires from step 8 to an output receptacle and line cord connector. Refer to figure 4.

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[2] There will be two wires connected to A4-9C, one coming off K1-3 and another from XK3-3.

W131P33 Output Receptacle (Opened View)

Green Screw (P33-3)
Brass Screw (P33-1)
White Screw (P33-2)

W131P45 Line Cord Connector (Opened View)

Green Screw (P45-3)
White Screw (P45-2)
Brass Screw (P45-1)

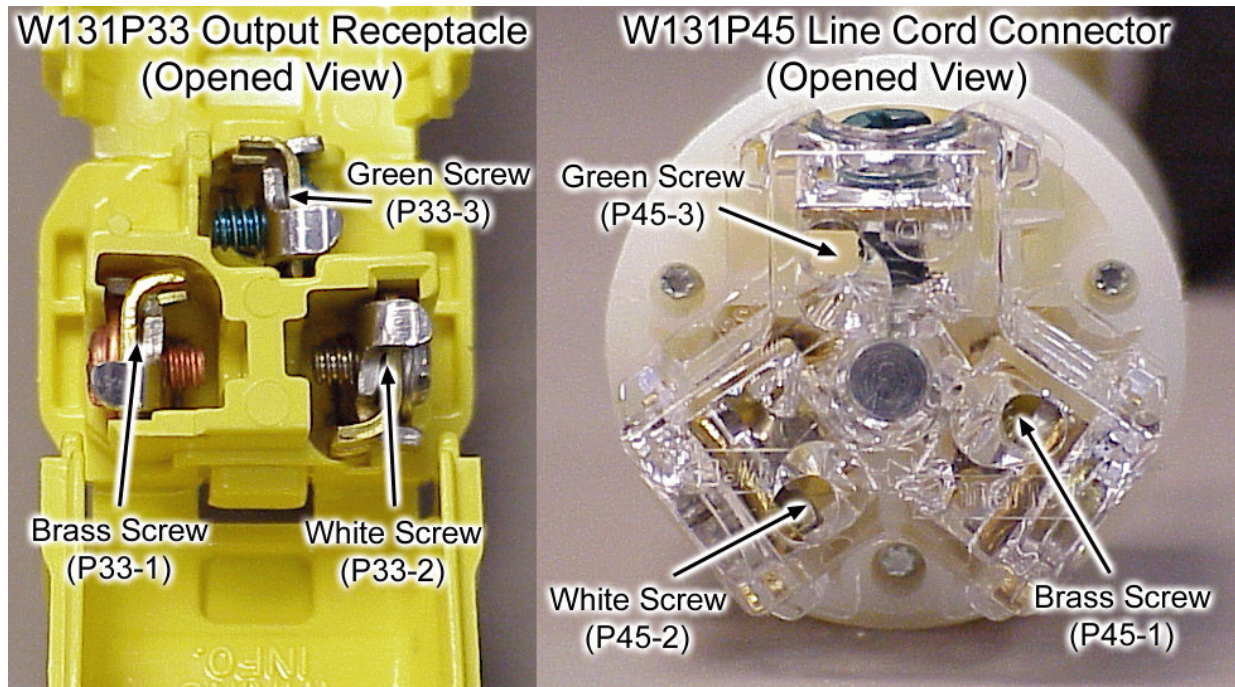**Figure 4   W131P33 and W131P45 Wiring Connections**

16. Spot tie any loose wires using cable ties.

17. Reattach and secure CB rack.

<div style="border:1px solid black; display:inline-block; padding:4px;">

CAUTION

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The harness attached to the VME rack will remain attached when removed from the DCP backplate. Care must be taken not to damage wiring or terminations during the following operations.

18. Carefully remove the four nuts and associated washers that fasten VME rack 2A1A2 to the DCP backplate. Carefully lift the VME rack off the backplate and gently rest it on top of the Faraday box, 2A3. The backplane connectors of the VME rack will now be accessible.

NOTE: When inserting wires into the digital I/O connector terminal P2, orient wire connectors with the locking pin *down*. Be sure to listen for a "click" sound which will indicate the pin is seated properly inside the connector terminal.

19. Route the four 22-gauge white wires to the VME rack connector 2A1A2XA12P2, and insert them as illustrated in figure 5.

EHB-11
Issuance 00-08
08/04/00

20. While the back of the VME rack is exposed, check the tightness of the grounding wires and lug terminal on the VME backplane.

21. Carefully reattach the VME rack to the DCP backplate using the hardware removed in step 8.

22. Reinstall the digital I/O board into the VME chassis.
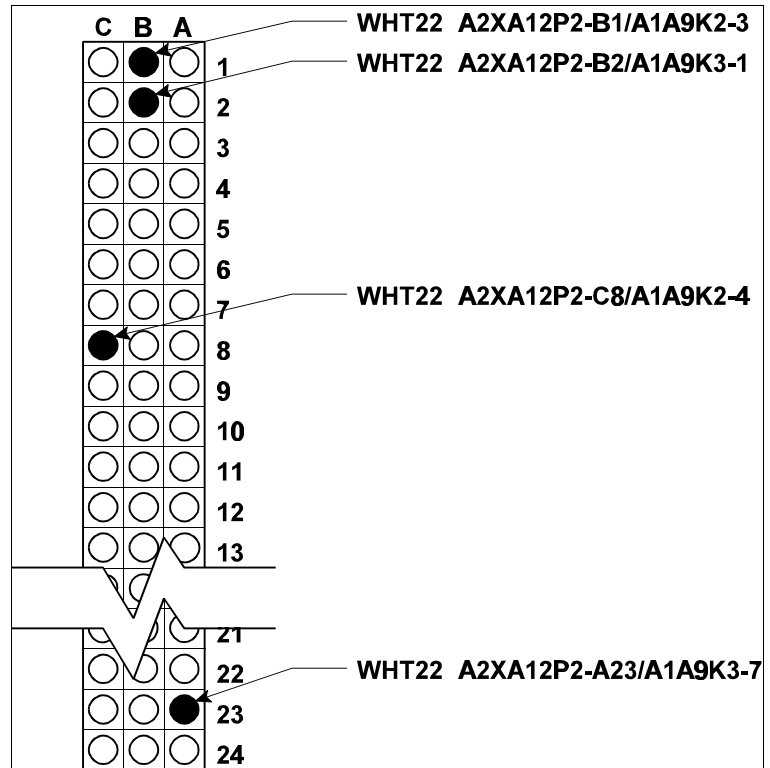

Figure 5   2A1A2XA12P2 Connections

CAUTION

The battery box (with batteries) is heavy. Take care to avoid injury due to improper lifting or accidental dropping of the battery assembly. Batteries can be damaged by a short circuit. Do not allow foreign material to enter the battery box connector.

23. Install the UPS kit into the DCP. Refer to figure 6.
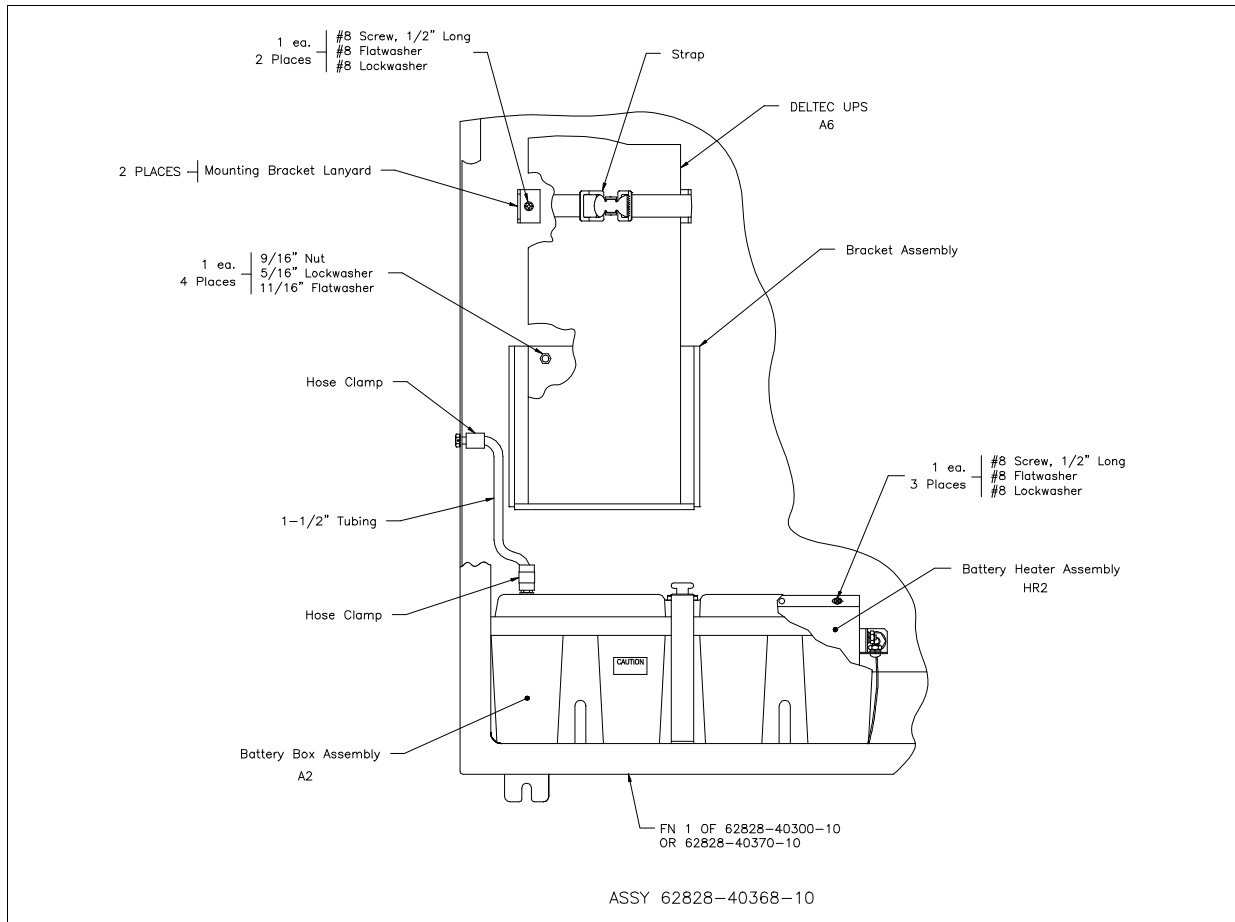
Figure 6   UPS Assembly and Battery Installation

24. Attach the following wires and connectors to the UPS kit.

Wire/Connector Label	Connect to
W15P44 (Battery Heater Cable)	A1HR2P1
W131P33 (From Step 8)	A1A6 OUTPUT
W131P45 (From Step 8)	A1A6 INPUT
W15P22 (RS232 SIO Cable)	W78P1
W78P2 (DB9 Connector on W78)	A1A6 COMM PORT
A2P1 (Battery Box Connector)	A1A6 BATTERY PORT

C. System Checkout

1. At the AC junction box, switch the circuit breaker labeled for the DCP to ON.

2. In the DCP, set the circuit breaker A1A3A1 to ON. On the front power panel of the UPS, switch the power switch to ON.

3. Before returning to the OID, perform the following:

    a. Verify the red LED on A1A9K2 is illuminated.

    b. Using a voltmeter, verify 115 VAC ± 10% are present across pins A1A9XK3-A and A1A9XK3-B.

4. Return to the OID, and configure the UPS as outlined in Maintenance Note 46.

5. With the UPS configured, perform the following checks:

    a. Key the following functions:
        MAINT - SEL DCP - DCP UPS
        Verify the UPS bypass status and command fields read:
        ▸   UPS INLINE: P
        ▸   CMD UPS INLINE   ON

    b. Key BYPAS
        After approximately 2 minutes, verify the UPS bypass status, command, and fail count fields read:
        ▸   UPS INLINE   F   1
        ▸   CMD UPS INLINE   OFF

    c. Return to the DCP, and verify the red LED on A1A9K2 is *NOT* illuminated. Using a voltmeter, verify *less than* 10 VAC are present across pins A1A9XK3-A and A1A9XK3-B.

    d. Key BYPAS
        After approximately 2 minutes, verify the UPS bypass status, command, and fail count fields read:
        ▸   UPS INLINE   P   1
        ▸   CMD UPS INLINE   ON

6. Return to the DCP, and toggle power switch on the rear panel of the UPS to OFF. The DCP should go to bypass mode and continue operating without a glitch. Wait approximately 2 minutes; restore power to the UPS once again.

7. Return to the OID, and verify the UPS bypass status, command, and fail count fields read:
   ‣ UPS INLINE   P   2
   ‣ CMD UPS INLINE   ON
   Review the SYSLOG, and verify error messages "DCP UPS OUTPUT DISABLED" and "DCP UPS BYPASSED" were issued.

8. Check the 12-HR sensor pages to ensure data is being collected from the sensors. Clear all failures on the MAINT page caused by powering the system down and proceed to "AFTER UPS INSTALLATION."

D   After UPS Installation

1. Contact the AOMC at 1-800-242-8194 and inform the operator of:

   a. Your location.

   b. The installation of the UPS kit and UPS bypass relay have been completed.

2. Enter in the SYSLOG that maintenance has been completed. Key the following functions: **MAINT - ACT - FMK**.

   For the FMK number, enter: **MOD 66**. On the second line of the screen, verify only MOD 66 is displayed. Complete by entering Y in the [Y/N] area if only MOD 66 is displayed.

3. Check the SYSLOG, and verify the FMK message. Enter a comment in the SYSLOG stating the UPS has been installed.

E. Reporting Modification

Target date for completion of this modification is 30 days after receipt of parts. Report the completed modification on a WS Form A-26, Maintenance Record, using instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System (EMRS), part 2, appendix A. Record the following items:

- **ADCP** in block 7
- **S100-1A4A1-2** in block 13a
- **6130-01-411-5252** in block 13b
- **M** in block 13c
- **M** in block 13d
- **999** in block 13e
- **1** in block 13f
- Number of hours spent installing the UPS in block 13g
- **66** in block 17a
- **62828-90228-20** in block 18, vendor part number (new part)
- **N/A** in block 18, serial number (old part)
- The serial number of the new UPS in block 18, serial number (new part)

See appendix **C** for a completed sample of WS Form A-26, Maintenance Record.

Original Signed

John McNulty
Chief, Engineering Division

Appendix A - Site Table
Appendix B - Parts List
Appendix C - A-26 Sample Form

Class I ASOS Sites to Install a UPS into the DCP			
Site ID	City, State	Region	DCP Cabinet Width
AQQ	Apalachicola, FL	Southern	42"
RAC	Racine, WI	Central	42"

EHB-11
Issuance 00-08
08/04/00

S100-FMK127 Large DCP UPS Installation - Alphabetical Listing		
Part Number	**Quantity**	**Nomenclature**
	1	Wire Marker: P33-3/A1A4-23A
	1	Wire Marker: A1A4-23A/P33-3
	1	Wire Marker: P45-2/A1A4-9B
	1	Wire Marker: A1A4-9B/P45-2
	1	Wire Marker: P45-3/A1A4-23B
	1	Wire Marker: A1A4-23B/P45-3
62828-40368-10	1	UPS Kit
62828-40431-10	1	UPS Bypass Kit
62828-42029-20	1	RS232 Adapter Cable (W78)
62828-90141-2	3	Insulated Crimp Receptacle
62828-90229-1	2	Standoff Mounts
62828-90344-1	2	Electrical Plug
62828-90345-1	2	Connector Body
M16878/5BKE8	1	3' Gray Wire, 14 AWG
M16878/5BKE9	1	5' White Wire, 14 AWG
M16878/5BKE5	1	6' Green Wire, 14 AWG
MS15795-805	2	5/32" ID x 5/16" OD Flatwasher
MS3367-4-9	12	Wire Tiedown Straps
MS35338-136	2	No. 6 Lockwasher
MS51957-31	2	No. 6 Screw, 5/8" Long
UPS Bypass Kit (62828-40431-10) Alphabetical Listing		
Part Number	**Quantity**	**Nomenclature**
62828-40431-1	1	Marker No. 1 (P45-1)
62828-40431-2	1	Marker No. 2 (A1A9XK3-2)

62828-40431-3	1	Marker No. 3 (A1A9XK3-3)
62828-40439-4	1	Label, "K2"
62828-40439-5	1	Label, "K3 XK3"
62828-42102-10	1	DCP UPS Bypass Wire Harness (W131)
62828-90132-1	2	Spade Lug
62828-90428-1	1	High Power Relay (K3)
62828-90429-1	1	Digital I/O Module (K2)
62828-90430-1	1	High Power Relay Socket (XK3)
62828-90438-1	1	Wire Retainer, Relay
MS3367-4-9	12	Cable Ties
AUX Box Hardware Kit (62828-40429-10) **Alphabetical Listing**		
Part Number	**Quantity**	**Nomenclature**
51026	1	Moly Dry Film Lubricant
62828-40068-1	2	Mounting Angle
62828-90096-3	9	Liquid Tight Conduit
62828-90097-3	4	Electrical Conduit Connector
62828-90293-3	4	Packing with Retainer
MS15795-814	8	13/32" ID x 13/16" OD Flatwasher
MS15795-817	8	½" ID x 1-1/2" OD Flatwasher
MS35308-364	6	Screw Cap
MS35335-63	2	3/8" Tooth Lockwasher
MS35338-141	7	3/8" Lockwasher
MS35338-143	8	½" Lockwasher
MS51972-3	6	3/8" Nut
MS51972-5	8	½" Nut
NAS3108C28-24	4	Bolt-U

UPS Kit (62828-40368-10) Alphabetical Listing		
Part Number	**Quantity**	**Nomenclature**
62828-40266-20	**1**	**Bracket Assembly**
62828-90338-20	**1**	**DELTEC UPS**
62828-90341-3	**1**	**Strap**
62828-40263-1	**2**	**Mounting Bracket Lanyard**
62828-40223-10	**1**	**Battery Heater Assembly**
62828-40262-10	**1**	**Battery Box Assembly**
62828-90168-1	**2**	**Hose Clamp**
62828-90185-1	**1**	**1-1/2' Tubing**
MS51957-45	**5**	**No. 8 Screw, ½" Long**
MS15795-807	**5**	**3/16" ID x 3/8" OD Flatwasher**
MS35338-137	**5**	**No. 8 Lockwasher**
MS35649-2314	**4**	**9/16" Nut**
MS35338-140	**4**	**5/16" Lockwasher**
MS15795-812	**4**	**11/32" ID x 11/16" OD Flatwasher**

EMRS A-26 Form